

REMARKS

Upon entry of the present Reply, claims 1-10, 12 and 14-44 are pending in the application. Claims 1, 10, 12, 14, 25, 26, 29, 30 and 32-34 are amended and claims 11 and 13 are cancelled herein. Support for the amendment of the independent claims may be found, for example, in the claims as originally filed and at page 28, lines 1-3. The dependent claims 12, 14, 26, 30, 33 and 34 are amended in correspondence with the independent claim amendments.

Applicant respectfully submits that all of the claims are allowable over the prior art of record in this application and Applicant respectfully requests the Examiner to withdraw the rejections of all of these claims and to allow all of them.

Applicant's Invention

Applicant's invention relates to a process for removing a source-derived contaminant from a hydrocarbon-containing material, in which the hydrocarbon-containing material is, e.g., recycled petroleum product, such as recycled engine oil, or the product of a pyrolytic plastics recycling operation. In the past and in the prior art, such recycled materials have been found to be contaminated to a point which rendered them undesirable for many uses to which virgin, refined petroleum-source hydrocarbons are generally put. The contaminations included, for example, undesirable odor and color. The Applicant operates a used-petroleum product recycling plant and has developed the present invention in an effort to obtain a product that is more widely useable than prior art recycled petroleum products. The presently claimed invention allows the Applicant to remove such contamination in an efficient, cost-effective way.

Rejection of Claims over Prior Art.

In the Office Action dated 21 November 2007 all of the pending claims were rejected as obvious over the basic combination of Garrett and Bullock, and in some cases, Lee, Ciora and/or Johnson. Applicant traverses the rejections of the claims over

Garrett and Bullock, with or without Lee, Ciora or Johnson, for at least the following reasons.

None of the cited references disclose or suggest in any way that the processes disclosed could include the process as presently claimed, including heating the clay and the clay-contaminant adduct to regenerate the clay material, and providing the regenerated clay material from the regeneration step for reuse in the contacting step, wherein the clay is capable of sorbing the source-derived contaminant through at least 300 cycles of regeneration and reuse.

To the contrary, Ciora et al. teaches that the clay begins to lose its adsorbing capability after only five cycles of adsorption/generation. See, e.g., Table 4, col. 11, lines 18-31 of Ciora et al. In Table 4, Ciora et al. teaches that after the fifth regeneration, the fifth cut, when only 0.324 gallons of produced oil per pound of adsorbent had been obtained, the color exhibited by the oil exceeded ASTM Index 8. To similar effect, in Table 6, col. 12, lines 4-15, Ciora et al. disclose that after five adsorption/regeneration cycles, the very first cut taken from the product oil exhibited a "slight" sulfur/mercaptan like odor, and that by the second cut, the odor was no longer "slight". Applicant's invention provides a much greater volume of hydrocarbon treatment per cycle of adsorption/regeneration and the clay material is capable of at least 300 cycles of regeneration before the clay becomes so heavily loaded with contaminants that cannot be removed in the thermal regeneration process that it must be discarded and replaced. Ciora et al. contains neither disclosure nor suggestion of any such capability.

Further to the contrary, Lee et al. teaches, at col. 13, lines 58-64, that while the contaminated clay may be regenerated, it is more often made acceptable for land filling by placing the contaminated material inside the cracking vessel and allowing it to be passed through the coking operation to form ash cake, which is subsequently removed and disposed. Lee et al. does not even suggest that the clay could be regenerated the number of times Ciora et al. claims, much less the presently claimed at least 300 times.

There is nothing in the disclosure of Lee et al. to suggest the presently claimed feature, wherein the clay can be reused at least 300 times.

Applicant respectfully notes that Lee et al. discloses using the clay in a filtration unit, to remove tar-like material or gum-like material remaining in the product oil. In Applicant's claimed process, the clay is not acting as a filter, but is instead acting to sorb trace materials, such as color, odor, traces of chloride or other chemical contaminants from the hydrocarbon material. Applicant's feed material has already been filtered when it reaches the contacting step.

Furthermore, Applicant notes that while Lee et al. teaches a clay filtration step, the Lee et al. process includes further processing, i.e., a final distillation, following the clay filtration step. See, col. 14, line 9 to col. 15, line 14, describing the further processing to remove particulates and water. Such further processing is distinguished by Applicant's claims 1-24, which specify that the process does not include additional or separate steps to remove any contaminant after the contacting step. In addition, Applicants' claims 35-39 specify that the removed hydrocarbon material is a refinery-grade material and is not subjected to either cracking or fractionation subsequent to the removing, thus further distinguishing over Lee et al., which clearly teaches the final distillation after the clay filtration. This final distillation is a fractionation, and such an additional step is excluded by claims 35-39.

Accordingly, Applicant respectfully submits that the combined prior art references applied in the Office Action to which this Reply is responsive cannot have rendered obvious any of the pending claims, in any of the asserted combinations, with or without the tertiary references. For this reason, Applicant respectfully submits that all of the presently pending claims fully distinguish over the prior art and are in condition for allowance.

CONCLUSION

As shown by the foregoing, Applicants respectfully submit that the presently disclosed and claimed invention patentably distinguishes over the asserted prior art.

Accordingly, Applicants request the Examiner to withdraw the previously stated rejections and to allow the present claims.

If any issues remain, or if the Examiner considers that a telephone interview would be helpful to facilitate favorable prosecution of this application, the Examiner is invited to telephone the undersigned attorney. Applicant respectfully requests the Examiner to telephone the undersigned to discuss any additional changes that may be made to facilitate allowance of the present application.

It is believed no additional fee is required for this filing. However, if any additional fee is required, please charge the fee to Deposit Account No. 18-0988, Order No. ORRCP0100US.

Respectfully submitted,

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